



# Australian Population Association

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12th Biennial Conference

population and society: issues, research, policy

15-17 September 2004 - Canberra, Australia

## Do Children From Small Families Do Better?

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Presidential Address to the 12th Biennial Conference of the Australian Population Association, Canberra 15-17 September 2004





## Introduction

My interest in the topic of this lecture arose out of an investigation of links between early lifecourse variables, including the number of siblings a person had when growing up, and later lifecourse demographic outcomes, particularly childlessness. Differences in the attainment of socioeconomic status may mediate such relationships (Parr, forthcoming). Differences in educational and labour market outcomes, and the accumulation of financial assets by the size and characteristics of the family of origin are one aspect of Australia's "demography of disadvantage", to use the title of Gavin Jones' WD Borrie lecture to the Sydney conference, and according to the theory of Nobel Prize winning US economist Gary Becker may help to explain family size limitation (Becker 1981, Jones 2002).

Perhaps the most persuasive and extensive analysis of the relationships between family size and educational achievement has been demographer Judith Blake's analysis of white Americans (Blake 1989). According to Blake, a larger number of siblings has negative effects on a person's educational achievement because of the dilution of per child parental time, attention and interaction, parental material resources per child, and the dilution of parental emotional and physical energy with the arrival of and provision of care for extra children. The more childlike intellectual level which she claims prevails in families with more children, and the reduced sense of urgency to associate and play outside of the family of those with more siblings, according to Blake may further help to explain the lower levels of educational attainment of those from larger families. Blake found that children from smaller families are more likely to have been read to by parents early in life, and more likely to engage in intellectual and cultural pursuits. This she argues may help to explain their better educational outcomes. She found the effect of the number of siblings on educational achievement was greater on the chances of completing high school than on the chances of completing college.

Whilst Blake's analysis focuses on explaining the educational outcomes by number of siblings, it would appear to me that many of the mechanisms through which, she argues, family size influences educational outcomes could also affect labour market outcomes, since, after all aren't many parents more concerned with their children's labour market outcomes than education? And educational success is just a means to the end of labour market success not an end in its own? Hence the dilution of parental time, material resources, and energy affect the communication of parental support of aspiration for labour market success, know-how and ideas on how to do so, and the provision of resources which may facilitate this end, as well as educational outcomes (Marjoribanks 2002).

As argued in a recent paper by Keister (2003), in addition to affecting wealth via its effects on education and hence income, the number of siblings a person has affects the value of the financial resources they receive as a result of inheritance and transfers from their parents whilst they are alive. The affordability of higher-quality private schools for each child may also be enhanced by having fewer children, which may enhance educational attainment, and eventually the income and wealth in later life (Jones 2002).

Economist Allan Kelley is skeptical about the "parental resource dilution hypothesis" (Kelley 1994). He argues that neither the material resources nor the parental time spent per child need necessarily reduce as the number of children increases, because parents may work longer or harder to provide extra resources, finance the activities of children by drawing on saving, or sacrifice expenditure (and time) on other activities. Younger siblings

in larger families, he argues, may benefit from the additional time, educational capital, experiences and materials of older siblings. Moreover with familial economies of scale, the sharing between siblings of reading materials, other educational resources and non-educational purchases, large families could plausibly be beneficial to the educational outcomes of their members.

### **Children and the Dilution of Parental Time, Expenditure, Income and Emotional Wellbeing: Recent Australian Evidence**

Recent research by Lyn Craig and Michael Bittman from UNSW, which quantifies time use differences between parents and non-parents in contemporary Australia, which show, not surprisingly, that the time mothers spend on child care are much greater than the time spent by fathers, and the differences between parents in time by type of childcare activity. Their results show that time spent in childcare is generally slightly greater for parents, especially mothers, with two children than for parents with one child. However they found the amount of time spent on childcare for those with three or more children is only greater than among those with two children when the youngest is over 5 years old (Craig 2003, Craig and Bittman 2003). It is clear from their results that hours spent on childcare divided by number of children reduces as the number of children increases. However whether this represents a dilution of the quality and impact of parental childcare cannot necessarily be inferred.

The AMP-NATSEM analysis of household expenditure data shows that, holding income constant, the total expenditure of households increases as the number of children increases. However, the “marginal expenditure” on an additional child reduces as the number of children increases (Percival and Harding 2002). However, as they point out, the extent to which this is attributable to economies of scale, such as the recycling of the books, toys and clothes of older siblings for use by younger siblings and the sharing of resources between siblings (which Henman’s normatively-based “Macquarie estimates” show should mean a reduction in the marginal cost of children as their number increases), and the extent it reflects the needs of children having to be sacrificed due to the budgetary squeeze with increasing numbers of children is not readily determined (Henman 2001). Moreover the effects of differences in earning by number of children are not factored in. Chapman et al. (2001) show the earnings women forego as a result of producing children are substantial, and the loss somewhat larger for those with more children than for those with just one child. However it is the first child to which the bulk of the loss of earnings is attributable.

Shields and Wooden’s analysed the effects on children on parents’ subjective wellbeing. Their regression analysis of responses on a 0-10 scale to the question; “all things considered, how satisfied are you with your life?” showed that, both for women and for men, satisfaction with life reduces and the number of dependent children aged less than 15 years increases. However life satisfaction increases as the number of adult children living away from home increases (Shields and Wooden 2003). All of which appears to support the conclusion; additional children ultimately raise satisfaction with life but only when they leave home!

## Data

The data I have used are from Waves 1 and 2 of the Household, Income and Labour Dynamics in Australia Survey (or HILDA for short). Wave 1 of this nationwide, longitudinal survey was conducted in 2001 and Wave 2 between August 2002 and March 2003. A multi-stage cluster sample of households was used. Remote areas of the country were not sampled (Watson and Wooden 2002a, 2002b, 2002c). The analysis was restricted to 3,478 males and 3,858 females aged 25-54 (age when interviewed for Wave 2). Those aged less than 25 were excluded from the analysis because many below this age have yet to complete education and establish themselves in the labour force. The over 55s were excluded because the income and financial assets of many above this age will have been affected by retirement.

Respondents were asked whether they ever had any brothers or sisters when growing up and, if so, how many. They were instructed to include half or adopted siblings but not step or foster siblings. The main focus of this presentation is how educational attainment, income and selected financial assets differ according to this variable. The results were analysed separately for males and females because educational attainment, income, and financial assets differ between the sexes.

The response variables analysed here are:

- i) Whether the respondent obtained a Bachelor's or higher degree (i.e Bachelor's, Bachelor's honours, Master's, Postgraduate Diploma or PhD).
- ii). Whether the respondent completed Year 12 or the overseas equivalent.
- iii). Gross income from all sources for last financial year prior to the interview (2001-02).
- iv). The total of the balances of all (i.e. own and joint) bank accounts. Informants were instructed to count negative balances and overdrafts as zero.
- v). The total value of superannuation (total pre-tax amount including preserved benefit).

In an attempt to control for the selectivity of the different family size groups, I have fitted multiple regression models including the control variables relating to the socioeconomic status and intactness of the family, the ethnicity of the respondent and his or her parents, birth order (which obviously correlated with the number of siblings), and the age of the respondent. Of these, parental occupation (measured when the respondent was aged 14), particularly the mother's occupation, may conceivably have been influenced by the respondent's number of siblings, with those with more siblings being more likely to have a mother who was not working outside the home. However since parental occupations may affect both their family size and the socioeconomic and educational attainment of their children they may also act as a confounding factor for the relationship between the two. The type of schooling of the respondent may also have been influenced by their number of siblings, since more children may mean parents are less able to afford to send children to private schools. However since it would also be affected by parental wealth and parental wealth may affect both their family size and the outcomes between the two, I have included it as a rough proxy (albeit a far from imperfect one) for the effect of parental wealth (Weerasinghe and Parr 2002).

## Results

### Univariate Analyses

An exploratory plot of the percentage obtaining a Bachelor's degree against the number of siblings a person has and whether they obtained a Bachelor's degree shows a clear inverse relationship. However the gradient is noticeably steeper for females than for males (Figure 1).

For females the percentage completing Year 12 also shows a clear inverse relationship with the number of siblings she has. Whilst for males, those with one sibling (i.e. from a 2-child family) have the highest rate of completing year 12. Above this number of siblings, however, there is a clear inverse relationship with the number of siblings. Again the gradient of the relationship is steeper for females than for males (Figure 2).

For females gross annual income reduces as the number of siblings increases. However for males there is little difference in income by the number of siblings. The highest income is for those with 3 siblings. Whilst for females those who grew up as only children has the highest mean gross income, for males those who grew up as only children have one of the lower average incomes (Figure 3).

Both for males and for females inverse relationships between the balance of their bank accounts and the number of siblings are evident. The main difference between the patterns for males and females is the much higher average value of bank accounts for females who grew up as only children (Figure 4). The value of superannuation generally declines as the number of siblings increases. Again the decline is somewhat steeper for females than for males (Figure 5).

### Multivariate Analyses

#### Females

From Table 1 is a thematic representation of the results of the five multiple regression models for females, we see that, even after controlling for all other variables, the number of siblings a woman had when growing up has a significant negative effect on her likelihood of having completed Year 12, attainment of a Bachelor's degree, gross income, the balance of her (and her partner's if she has him, her or them) bank accounts and the value of her superannuation. In all models non-linearity of the relationship was tested for by including the square of the number of siblings. However the siblings squared term proved not significant in each case.

The effect of age was significant for all response variables other than whether the respondent had a bachelor's degree. The information available on birth order was somewhat limited: indicating only whether or not the respondent was the oldest sibling. In terms of the two educational outcomes and the level of superannuation, females who were the eldest sibling when growing up fared better than those who were not.

The occupation of the father and the occupation of the mother were strongly related to most outcomes. For the father's occupation the best educational outcomes were for professional occupations and for occupations in the advanced clerical and service category (the largest subgroup of which was insurance agents, but which also includes secretaries and

personal assistants, and bookkeepers etc). However in terms of income, the daughters of men who were in managerial or senior administrative occupations fared best followed by the children of men in professional occupation.

The daughters of working mothers were generally more likely to have completed year 12 and to have gained a bachelor's degree, and generally earned more than the daughters of women who were not working. However, outcomes varied by type of maternal occupation. Of the various categories of mother's occupation the best outcomes, both in terms of education and income, were for the daughters of professionals and of those with occupations in the advanced clerical and service category (80% of this group were secretaries and personal assistants).

The type of schooling a female respondent had had was significant on all five outcome measures, with those who attended government schools being less likely to have completed Year 12 or a Bachelor's degree, earning less on average, having lower bank balances, and less superannuation. On most outcomes the various ethnicity-related variables do not have statistically significant effects.

## **Males**

On each of the five outcomes considered the sign of the coefficient for the effect of the number of siblings was negative. However whilst the number of siblings effect was clearly significant for completion of Year 12, attainment of a Bachelor's degree, and the total bank balance, it's effect on gross income was of marginal significance, and the effect on the value of superannuation was not significant. Generally the coefficients are smaller and less significant for males than for the equivalent analyses for females. As was the case for females, eldest siblings are more likely to have completed Year 12 and to have obtained a bachelor's degree, and have more superannuation than those who are not the eldest sibling.

As for females, the effects of parental occupations were highly significant. The sons of men in professional occupations achieved the best educational outcomes, whilst those whose fathers were in two low-skilled and predominantly male occupational categories, namely intermediate transport and production (truck drivers, plant operators etc) and labourers and related, did least well. In terms of income the sons of men in the clerical, sales and service occupations, professional, and managerial and administrative occupations fared best.

As was the case for their daughters, the sons of women who were working achieved higher rates of completing Year 12 and Bachelor's degrees and higher levels of income than the sons of women who were not working. Of the various categories of mother's occupation, the best educational and income outcomes were achieved by those whose mothers were in professional occupations or advanced or intermediate clerical or service occupations (clerks, receptionists etc). However the largest bank balances were those whose mothers were in managerial or administrative occupations.

As was the case for females, males who attended government schools fared significantly worse on all outcomes than those who attended non-government, non-catholic schools. On most outcomes most of the ethnicity variables did not have significant effects. The absence of statistically significant effects for ATSI status may be due to the small number of ATSI in the age range analysed (there were only 45 males and 86 females aged 25-54 in the sample), and the exclusion of very remote areas where the more demographically distinct elements of the ATSI populations are found.

## Conclusion

The answer to the question posed in the title of the talk is that children from small families generally do better than children from large families, at least in terms of educational attainment, income earned, the accumulation of savings in bank accounts, and superannuation. Earlier this year Australian Treasurer Peter Costello told the nation; "If you can have children it's a good thing to do - you should have one for the father, one for the mother and one for the country, if you want to fix the ageing demographic," (Dodson 2004). The implication of my results is that those who have already had "one for father" or "one for father and one for mother" by lying back to have "one (or more) for the country" do to the detriment of their existing children.

The evidence I have considered on the relationship between educational attainment and number of siblings is consistent with Blake's position. The advantageous effects growing up in a large family may have, according to Kelley (1994), if they exist at all appear to be more than outweighed by other negative effects.

Finally, on most outcomes the effect of the size of the family in which an Australian grew up is noticeably greater for females than it is for males. Part of the explanation of this may lie in "fertility running within families", that is those who grow up in larger families are more likely themselves to have had relatively large numbers of children and are less likely to be childless, and the effects of fertility on socioeconomic outcomes being stronger for women than they are for men (Figure 6). Thus the relative status of females is somewhat greater among those who grow up in relatively small families. These differences in fertility by number of siblings and the resultant drawing on saving to fund a larger family may also help to explain differences in saving-related variables, such as bank account balances and superannuation.

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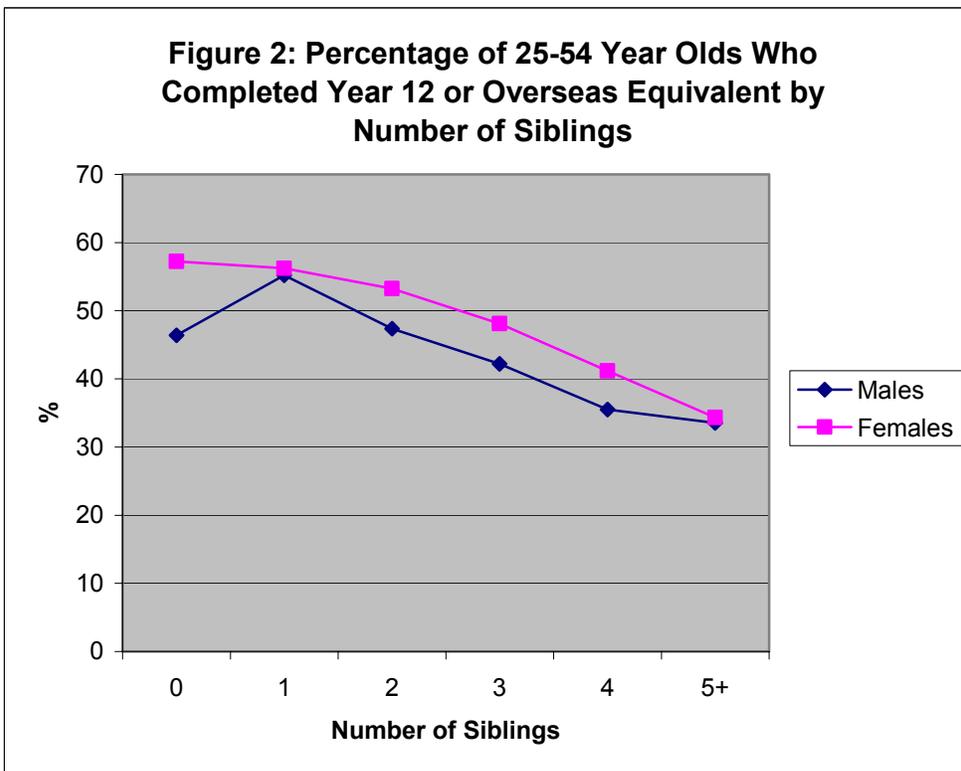
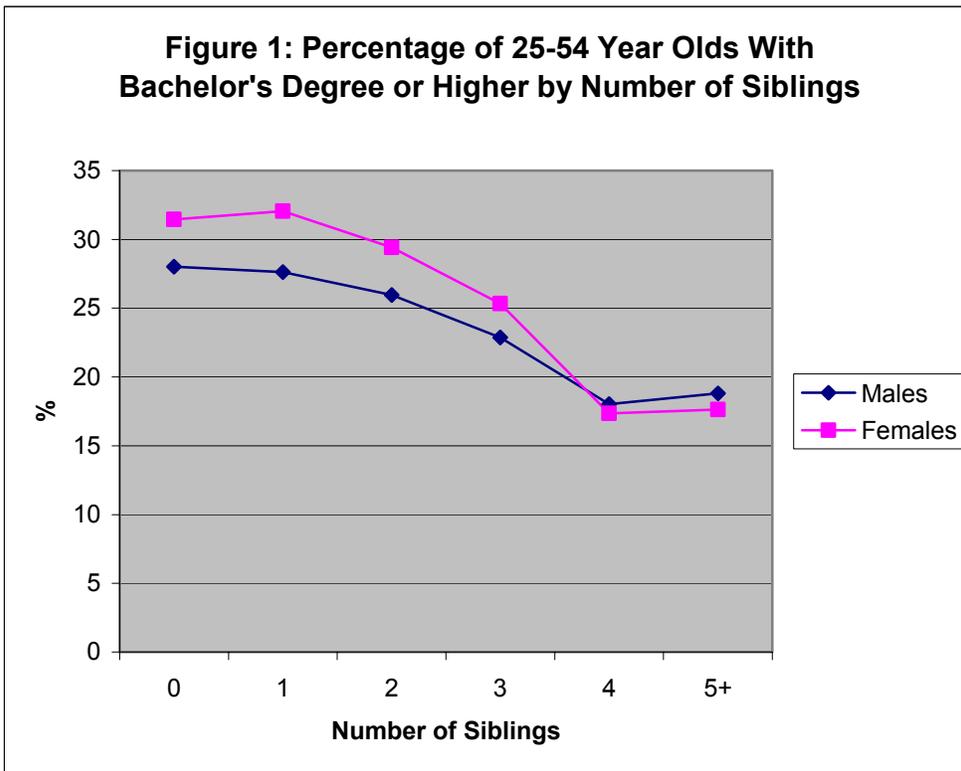
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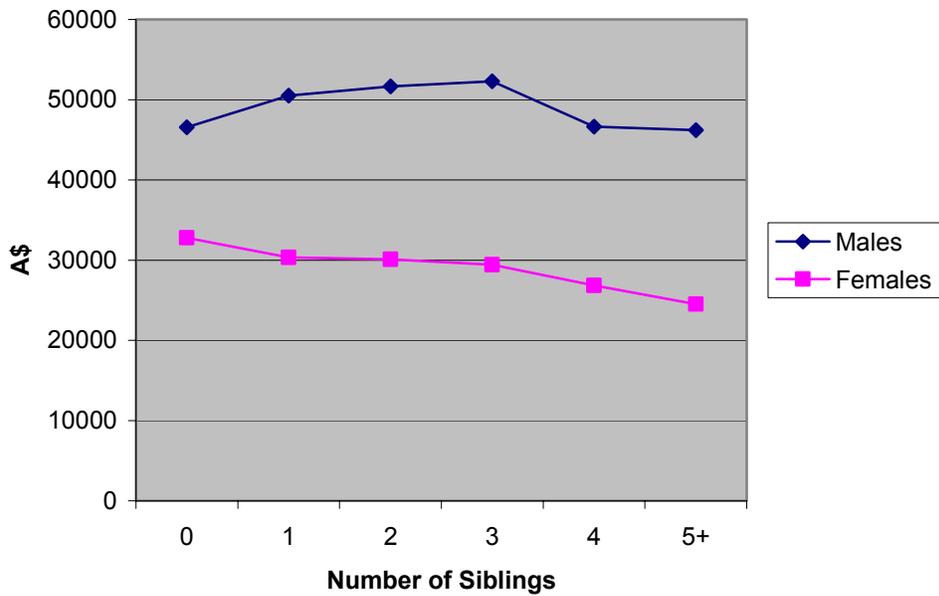
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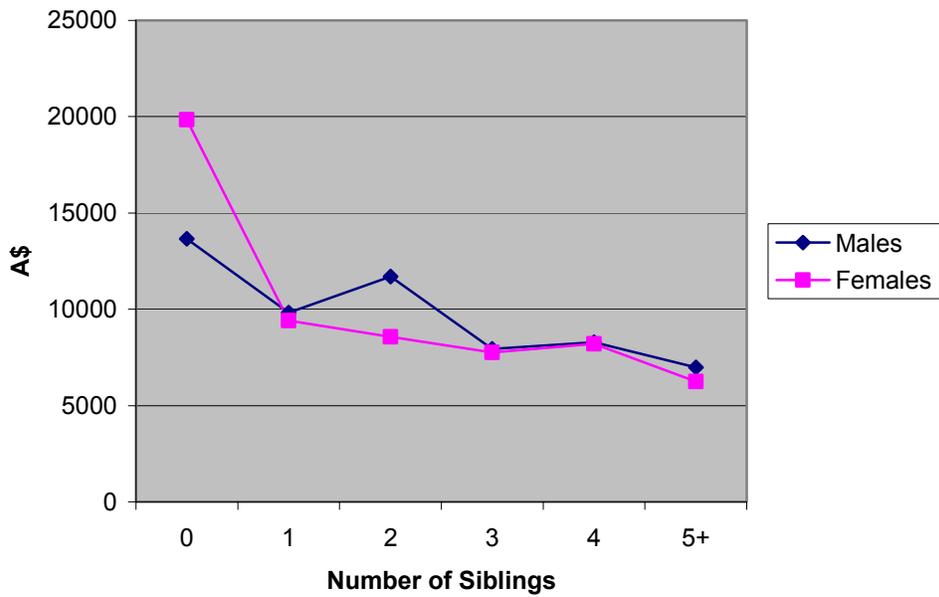
## Figures



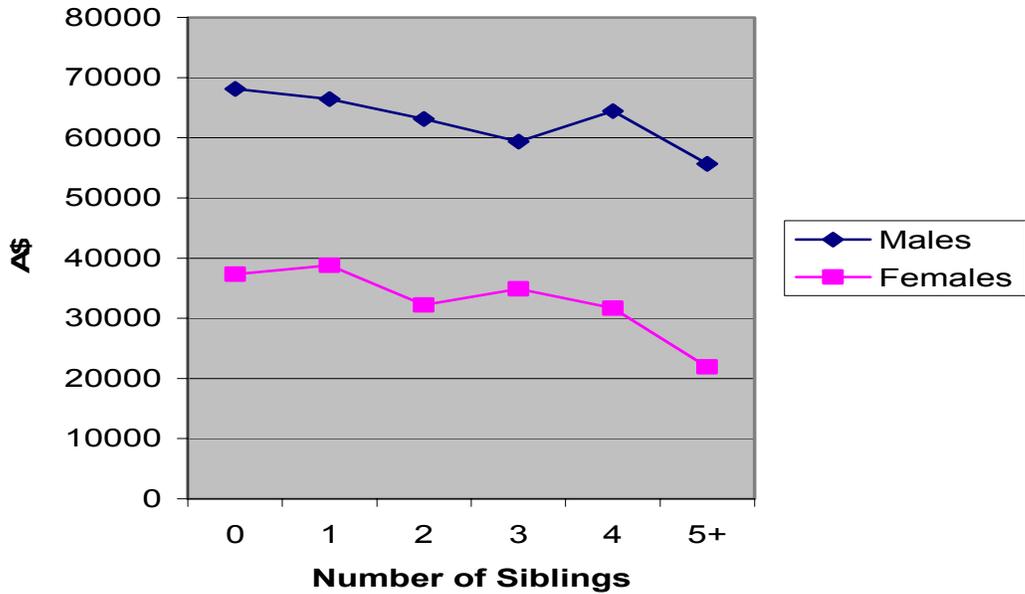
**Figure 3: Total Gross Financial Year Income of 25-54 Year Olds by Number of Siblings**



**Figure 4: Total Value of Bank Accounts (Own + Joint) of 25-54 Year Olds by Number of Siblings**



**Figure 5: Value of Superannuation of 25-54 Year Olds by Number of Siblings**



**Mean Number of Children Ever Had by Number of Siblings When Growing Up: 25-54 Year Olds**

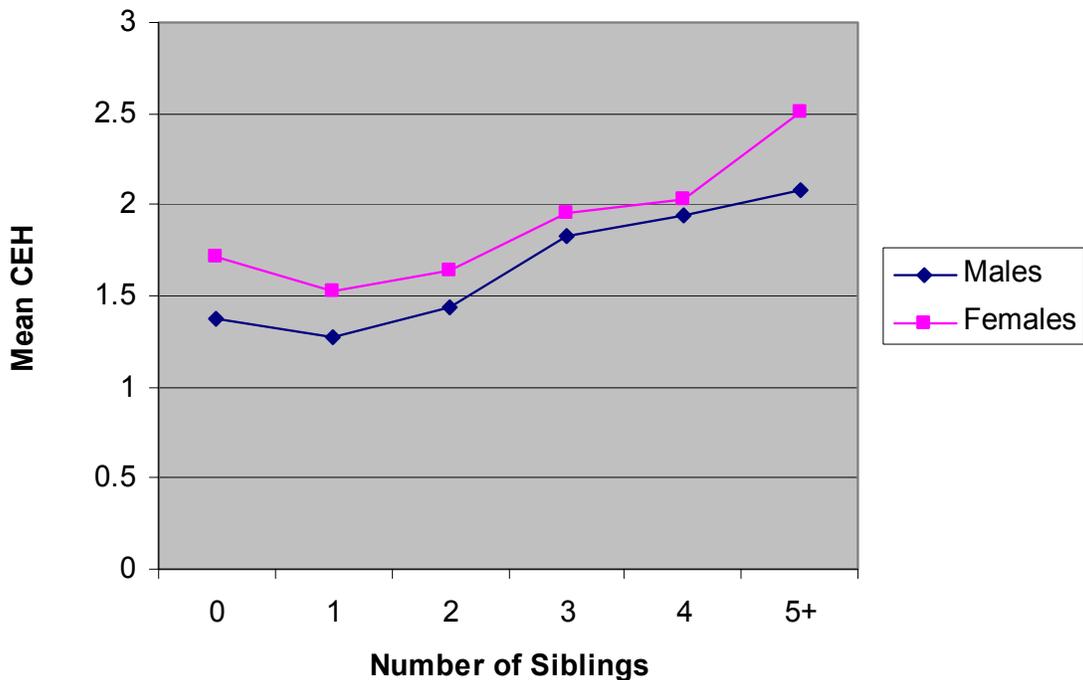


Table 1: Thematic Representation of Significance of Effects of Explanatory Variables (Rows) on Response Variables (Columns) in Analyses for Females

Response Explanatory	Bachelor's Degree	Year 12	Gross Income	Bank Balance	Superannuation
No of Siblings	-	-	-	-	-
Age		-	+	+	+
Birthplace					
Father's Birthplace					
Mother's Birthplace					
Language	-				
ATSI					
Birth Order	+	+			+
Father's Occupation					
Mother's Occupation					
Type of School					

Key: Dark Orange -  $p < 0.01$ ;  
 Light Orange -  $0.01 \leq p < 0.05$ ;  
 Turquoise -  $0.05 \leq p < 0.10$ ;  
 White -  $0.10 \leq p$

Table 2: Thematic Representation of Significance of Effects of Explanatory Variables (Rows) on Response Variables (Columns) in Analyses for Males

Response Explanatory	Bachelor's Degree	Year 12	Gross Income	Bank Balance	Superannuation
No of Siblings	-	-	-	-	
Age		-	+	+	+
Birthplace					
Father's Birthplace					
Mother's Birthplace					
Language	-				+
ATSI		-			
Birth Order	+	+			+
Father's Occupation					
Mother's Occupation					
Type of School					

Key: Dark Orange -  $p < 0.01$ ;  
 Light Orange -  $0.01 \leq p < 0.05$ ;  
 Turquoise -  $0.05 \leq p < 0.10$ ;  
 White -  $0.10 \leq p$